Data Scientists Chase Respiratory Illness Outbreak

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In the back of her mind, Utah epidemiologist Lindsay Meyers, director of medical data systems at Salt Lake City-based BioFire Diagnostics, LLC, was keenly aware of the threat of a novel respiratory virus popping up among the usual suspects of cold and flu-causing viruses. She didn't know 2020 would be the year such a virus would envelope the globe.

In November, 2019, about a month before the novel coronavirus that causes COVID-19 was identified in China, Meyers ran into her colleague Jay Jones, a Utah State University alum who was hosting a visit with his former mentor, Chris Corcoran, head of USU's Department of Data Analytics & Information Systems.

"It was a chance meeting," says Corcoran. "Jay and I were discussing possible projects for students in our new Master of Data Analytics (MDATA) program; Jay spotted Lindsay and immediately saw a potential fit."

Meyers welcomed the idea. "BioFire first implemented its real-time, automated monitoring system at hospitals in 2014, and it's now installed in more than 5,000 customer sites throughout the United States, as well as overseas," she says.
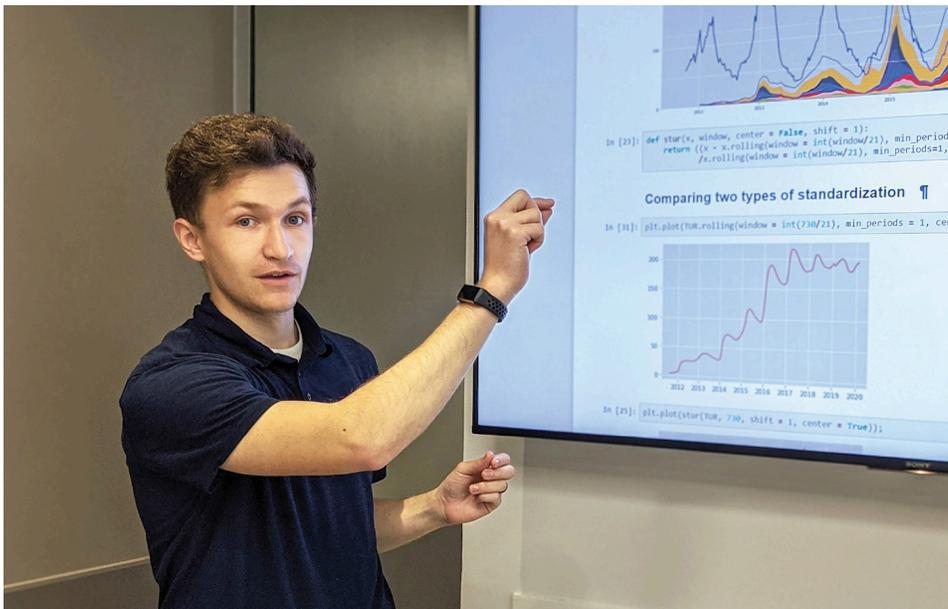
Collected data is uploaded to a cloud database, which forms a huge, and growing, dataset about the prevalence, seasonality and co-infections of dozens of respiratory pathogens detected in millions of patient samples. Harnessing the data to distill reliable information, including disease surveillance, is a formidable challenge.

Spencer Perry, graduate student in USU's Master of Data Analytics program, explains analysis of data collected on varied respiratory virus strains by research partner BioFire Diagnostics, LLC.

Corcoran, with USU colleague Richard Cutler, selected 16 MDATA students for the project, and quickly set to work. An interdisciplinary program coordinated by USU's DAIS, Mathematics and Statistics, Economics and Finance, and Computer Science Departments, MDATA brings a diversity of backgrounds and skillsets that aligned well with project needs. "Enlisting USU graduate students and faculty really bolstered our resources," Meyers says. "Tackling our dataset is like looking at a tree laden with cherries and only being able to pick a few."

Among the team's aims is developing ways to organize the data to maximize use of every morsel of information, including sequencing of DNA and RNA to identify strains and cross-reference genetic data.

Student team member Spencer Perry noted that "The challenge is in coming up with a way of standardizing the flood of data coming in from very different sites, collected by varied methods, to the BioFire system."

Meyers says she has full confidence in the USU team's efforts. "USU's graduate students have the intellectual capability and intense curiosity we need to pursue these big questions," she says. "Because of this and because they have oversight and guidance from excellent faculty mentors, I've had no hesitation sharing their analyses with the Centers for Disease Control."

Corcoran says the project is exactly the kind of real-world experience he strives to cultivate for his students. "These kinds of partnerships are crucial to prepare our students for the workforce," he says. "Nearly every company is now a data company. Employers need employees who can take on messy problems with no back-of-the-textbook answers.

Read the full press release here.